

Mammal and Domestic and Exotic Avian Surveillance Activities Plan

I. Introduction

Although members of the *Corvidae* family (crows and jays) and, to a lesser degree, raptors appear to be the best early indicators of WNV activity in an area, other birds and mammals can be affected by the disease or used as sentinels. Likewise, equine cases of EEE can be used in the same manner. Equine cases of WNV in Virginia appear to have less predictive value because they usually appear at the same time as human cases in an area. Of all the types of bird and mammal surveillance systems for arboviruses, surveillance by testing sick animals is likely to be the least sensitive and specific system, because most animals that become ill with clinical signs of encephalitis are more likely to have other causes of illness than an arbovirus infection. However, occasional cases of WNV and EEE infection may be detected by laboratory testing, particularly in sick horses and exotic birds, and such information will be utilized as part of the geographic and temporal surveillance for the disease.

II. Objective

Provide a protocol for testing appropriate mammals and domestic and exotic birds for WNV and EEE in Virginia.

III. Implementation Plan

This part of the plan includes equines, other domestic animals, wildlife, animals being tested for rabies, and exotic and domestic birds. The following are general statements regarding arbovirus surveillance for all these groups of animals:

- (1) Information and Education** – The Virginia Department of Agriculture and Consumer Services (VDACS), with assistance from the Virginia Department of Health (VDH), will develop and distribute information for appropriate groups such as owners and breeders of equines and exotic birds and veterinarians to increase awareness about WNV and EEE and the importance of reporting symptomatic animals.
- (2) Laboratory Test Interpretation** - Clear guidelines for interpretation of laboratory tests will be developed by the VDH and the laboratories performing testing (Division of Consolidated Laboratory Services [DCLS], VDACS Office of Laboratory Services, and Norfolk Public Health Laboratory [NPHL]). The need to determine whether test results indicate current or previous infection will be considered to avoid taking public health or animal health actions based on false positive or false negative results.
- (3) Communication of Results** - Testing of animals and reporting of results by laboratories will occur in a timely manner, allowing for appropriate quality control. All positive reports will be telephoned, faxed or electronically

transmitted to the Office of Epidemiology. Staff from that office will notify the involved Local Health Department (LHD) and VDACS if the animal was not tested by VDACS. VDACS will notify submitting veterinarians and/or animal owners and will work with the Office of Epidemiology and the involved LHD to notify local government, the media and the public. VDACS will maintain a website with information on equine arbovirus activity in Virginia.

- (4) **Release of Information** - Rapid sharing of surveillance results with government agencies and the public is essential for development of appropriate disease prevention and control measures. However, some confidentiality should attach to identification of affected privately owned animals to assure individual privacy of the owner and the treating veterinarian, if any. Therefore, to encourage reporting, owners' names and street addresses, treating veterinarians' names and street addresses, and names and addresses of persons submitting specimens shall be kept confidential. Information that will be available to agencies and the public with respect to privately owned animals will include the town and county where the specimen was collected, the species, the date of collection, and the arbovirus test results.

A. Equines

Surveillance for arboviruses in equines should be an ongoing part of the state plan because equines are potential sentinels for WNV and especially for EEE epizootic activity, and the horse industry is important to the economy of Virginia. Veterinary practitioners, equine associations, and VDACS are important partners in this endeavor.

Any equine with neurologic signs should receive a veterinary evaluation and appropriate diagnostic testing, with consideration for both rabies and arboviruses. Such animals should be reported to the nearest Regional Animal Health Laboratory (RAHL). The laboratory will advise on how to obtain and submit specimens (serum and/or CSF from live animals or necropsy tissues from dead animals), and coordinate testing. IgM Capture ELISA serologic testing on equine samples will be performed at the Warrenton RAHL (for WNV) and the National Veterinary Services Laboratories (NVSL) (for EEE).

B. Other Domestic Mammals

The occurrence of WNV and EEE in mammals other than equines appears to be rare. Veterinarians who are considering arboviruses in the differential diagnosis should contact the nearest RAHL before submitting specimens. For each request, the RAHL will determine, based on the history associated with the submission and/or the results of the necropsy examination, whether testing for arboviruses is warranted. Portions of the brain, heart, liver, and kidney will be submitted for histopathology and a second portion of the same tissues will be held frozen on all

specimens submitted. Any rapid screening tests developed for arboviruses, for example immunohistochemistry or immunofluorescence, will be utilized by RAHL on tissue specimens as appropriate. Tissues forwarded to DCLS will have virus isolation (VI) and /or RT-PCR testing to detect WNV and EEE. An exception is in the Eastern region where virus isolation will be conducted at the NPHL. Any positive VI cultures will be submitted to DCLS for further testing using RT-PCR.

C. Wild Mammals

Inquiries about sick and dead wildlife other than birds should be directed to the nearest Virginia Department of Game and Inland Fisheries (VDGIF) office. The utility of testing wild mammals for arboviruses, particularly WNV, remains in the research realm and will not be routinely conducted due to limited resources

D. Rabies Suspect Animals

In Virginia, mammals that have died of encephalitis are more likely to have died of rabies than WNV or EEE, and rabies can be transmitted to people by those mammals before they die (unlike WNV and EEE, for which no direct transmission between animals and humans in nature has been documented). Thus, it continues to be critical that all mammals with neurologic signs that could result in rabies exposure to people, pets, or domestic animals be submitted for rabies testing to one of the DCLS Rabies Laboratories (Richmond or Abingdon) or one of the District Rabies Laboratories (Fairfax or Norfolk) according to the guidelines established by those laboratories. Arbovirus testing of dead mammals that have been submitted for rabies testing will take place according to the following guidelines:

1. Rabies negative species will be tested for WNV as resources permit and after consultation with VDH, VDACS, and DCLS.
2. A priority for WNV and EEE testing will be given to specimens from rabies-negative dead equines because of the previous incidence of illness and death in equines.
3. Other domestic and wild species will be tested as resources permit, and for research purposes to document the frequency of WNV-related illness and death in mammals.

E. Exotic Birds

Some exotic birds such as those found in zoos and aviaries may be more susceptible to WNV or EEE. Ostriches and emus are particularly susceptible to EEE. Keepers of exotic birds should be informed about arboviruses and that sickness or death among such birds be reported to a RAHL. Veterinarians who

are considering arboviruses in the differential diagnosis should contact the nearest RAHL before submitting specimens. For each request, the RAHL will determine, based on the history associated with the submission and/or the results of the necropsy examination, whether testing for WNV and EEE is warranted.

F. Domestic Birds

1. **Sentinel Chicken Flocks** - In Virginia, sentinel chicken flocks often help indicate areas of increasing WNV and EEE viral activity and can be used to focus control and prevention efforts. Setup and maintenance of sentinel chicken flocks is relatively inexpensive, requires fewer labor hours and results in more useful information than some other arboviral surveillance techniques (See [Attachment 1B](#)). LHDs should consider working with their local governments to establish sentinel chicken flocks to improve arbovirus surveillance.
 - a. Utilizing cloacal swabs from sentinel chickens appears to be an effective means of identifying WNV activity. In this method, the virus shed by infected chickens is detected using a more sensitive RT-PCR test. Cloacal swabbing has several advantages over traditional blood sampling, including a higher frequency of testing (twice a week vs. once every two weeks), quicker indications of increasing activity, and less time and manpower for collection of samples. However, cloacal swabbing does not appear to be a good monitoring technique for EEE activity. Training on the use of cloacal swabs is available from DCLS. DCLS will conduct testing on the cloacal swabs and serology on corresponding chickens.
 - b. The method traditionally used to determine both WNV and EEE activity in sentinel flocks involves testing blood samples from the birds. Blood is collected from sentinel chickens at two-week intervals. Production of antibodies to the virus (seroconversion) in infected chickens is detected in blood samples using ELISA tests. Training on obtaining blood samples is available from localities that have experience with such flocks (Arlington County, Chesapeake City, Langley Air Force Base in Hampton City, Norfolk City and Virginia Beach City). Samples can be submitted to either NPHL or DCLS.
2. **Existing bird flocks** - If appropriate and resources allow, VDACS will assist VDH in identifying options for testing existing flocks of birds. These birds could include those that already have routine blood samples taken, such as birds going to shows, birds in existing flocks that could be easily tested (for example, 4-H birds), or birds on egg farms.